

**GENETICS OF DORSAL HAIR-TUFTS ON THE
CATERPILLAR OF *ORGYIA ANTIQUA* (L.)
(LEP.: LYMANTRIIDAE)**

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THE CATERPILLAR of the vapourer moth *Orgyia antiqua* has four distinct tufts of hairs on its body. These are located dorsally on segments IV to VII. The coloration of these tufts is usually yellow (Porter, 1997), but has been found to vary, showing shades of yellow, white, ochre and brown. One of us (JBJ) found a normal (yellow) caterpillar of *O. antiqua* in his garden. This was fed up on garden *Bergenia* (the pabulum on which it was found) and, after pupation and subsequent emergence, the resulting wingless female was left outdoors for 24 hours in the hope that a wandering male would find it and impregnate it. This was successful, and an egg batch was obtained from her. Some of the resulting caterpillars were kept for rearing purposes and the rest were released back into the garden. At this stage it was planned to mate the siblings to see if any recessive varieties of the moth would ensue. After the first couple of instars, however, it was apparent that there were varieties aplenty in the larvae themselves; this variation being in the coloration of the hair tufts for which this species is noted. It was decided to record the colours of the four main tufts which are placed dorsally on segments IV to VII and then to mate some of these varieties in order to disentangle the underlying genetics. It was apparent that the colours of the two tufts on segments IV and V segregate separately from the other two tufts. These pairs are shown as S and R diagrammatically on figure 1.

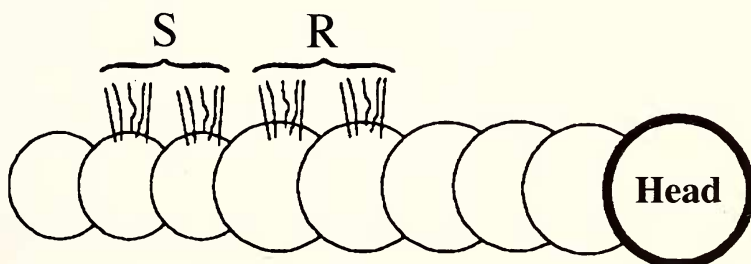


Figure 1. Hair tuft groups R and S of the caterpillar of *Orgyia antiqua* (L.).

In normal individuals, all four tufts are bright yellow, but we found four main colour types in this sample - yellow, ochre, brown and white. Ochre varied in shading from near-white to near- brown and yellow occurred in various shades also. As a first approximation, these shades were scored as near as possible to the four colours mentioned above. The four main colours segregated as follows :

Colour of hair tuft group R	Colour of hair tuft group S	Number with this combination (total = 77)
Y	Y	18
O	O	10
B	B	5
W	W	9
W	Y	1
B	Y	8
O	Y	18
B	W	1
Y	O	1
W	O	1
B	O	5

Figure 2. Colour patterns in hair group tufts of larvae of *Orgyia antiqua* (L.). Y = yellow, O = ochre, B = brown, W = white. The larva of the female parent had both tuft groups yellow; the larva of the male parent is unknown.

Thus, of the seventy-seven individuals in this analysis, 42 were unicoloured (tuft groups R and S the same colour) and thirty-five were bicoloured (tuft groups R and S of different colours).

In addition, there were two teratological specimens - one with five tufts and one in which the tufts on segments V and VII were reduced in size and laterally displaced.

Successful matings were obtained from selected combinations when imagines subsequently emerged and the resulting egg batches were kept over the following winter. Most of these hatched, but disease struck early on. It became obvious that all of the stock would be lost and so the survivors were reluctantly released in the hope (vain, so far) of finding more descendants at a future date.

Those adults which did emerge showed no obvious morphological variation.

Discussion

The results obtained appear to be an example of multifactorial inheritance with possibly as few as two loci, though probably more, being involved in the production of hair tuft colour. Using standard biometrical analysis, we have attempted to force the data to fit the patterns obtained, but the assumptions made have relied too heavily on highly improbable combinations of genotypes for both parents to be given much credence. The final analysis must wait until more stocks can be obtained to generate more detailed data. It may well be that what we observed involves the break-up of a supergene in a local population which controls the colours of all the hair tufts on the caterpillars.

References

Porter, J. 1997. *The Colour Identification Guide to Caterpillars of the British Isles*. Viking.